
Roadway Design Geopak Help Manual

Form Grades

RWD CADD Support (3-1-2010)

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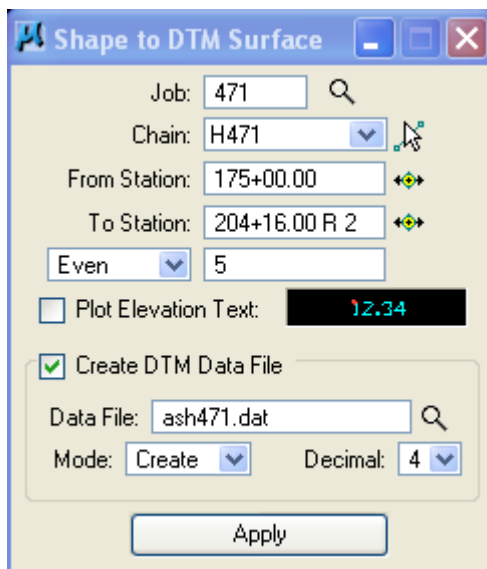
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Placing Form Grade Labels

Creating a TIN of your Superelevation Shapes

The Shape to DTM Surface tool allows you to create a DAT file which allows you to then be able to Build a TIN file of your proposed shapes which can then be used to aid you in creating form grades. Everytime you create superelevation shapes or change your proposed profile, you should go through this process.

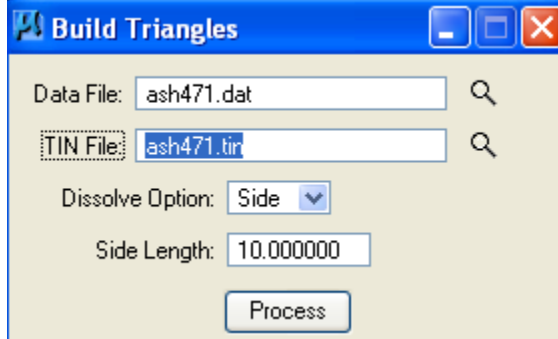
1. Through Road → X-Sections → Superelevation Tools → Shape to DTM Surface.



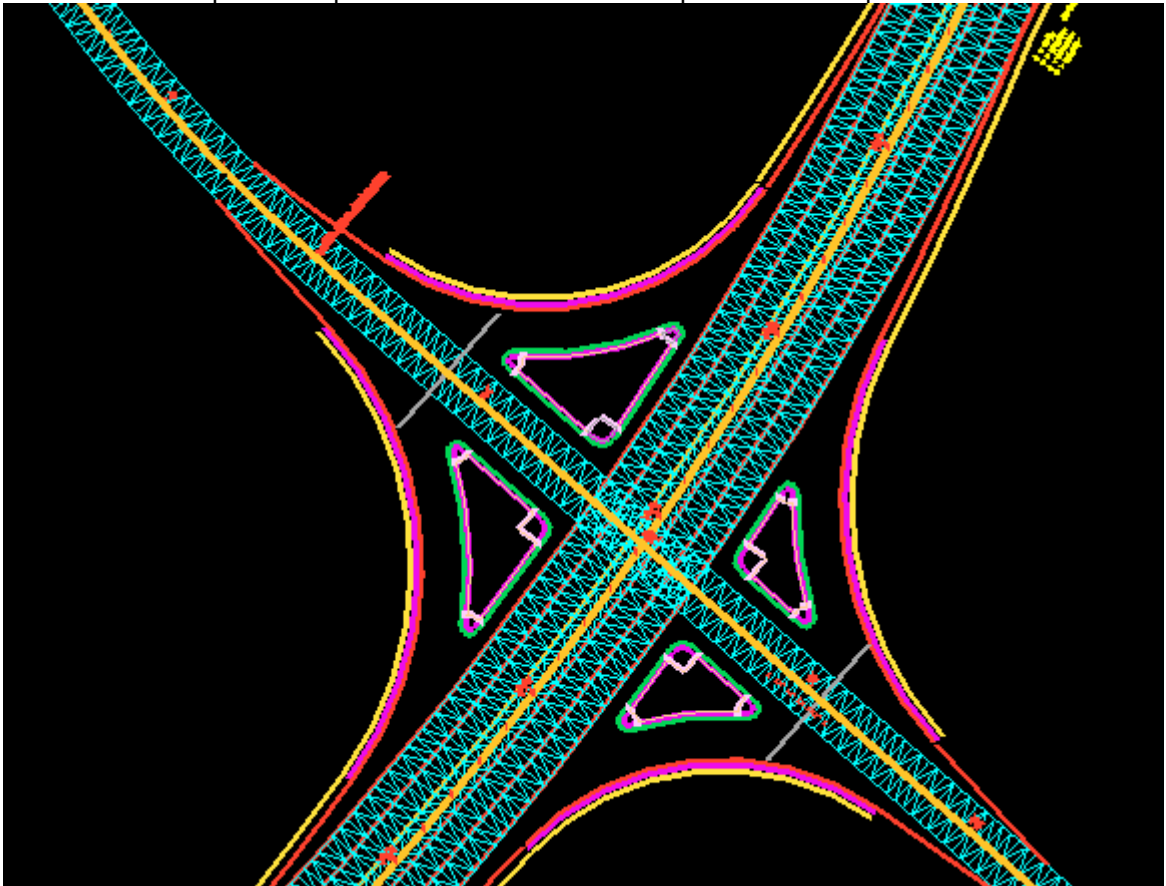
The screenshot shows the 'Shape to DTM Surface' dialog box with the following fields and options:

- Job: 471
- Chain: H471
- From Station: 175+00.00
- To Station: 204+16.00 R 2
- Even: 5
- ☐ Plot Elevation Text: 12.34
- ☒ Create DTM Data File
- Data File: ash471.dat
- Mode: Create
- Decimal: 4
- Apply button

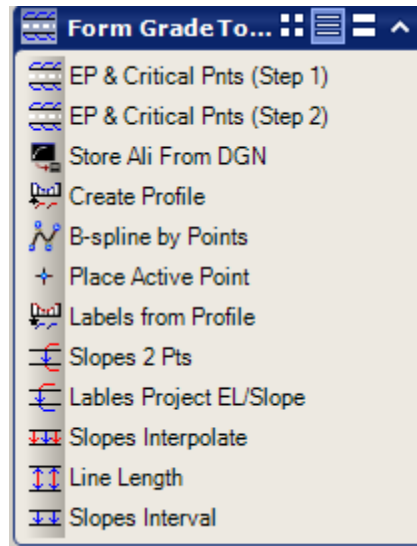
2. Go to DTM Tools -> Build Triangles to create your TIN.



Below is an example of two plotted TIN's created from Superlevation Shapes:



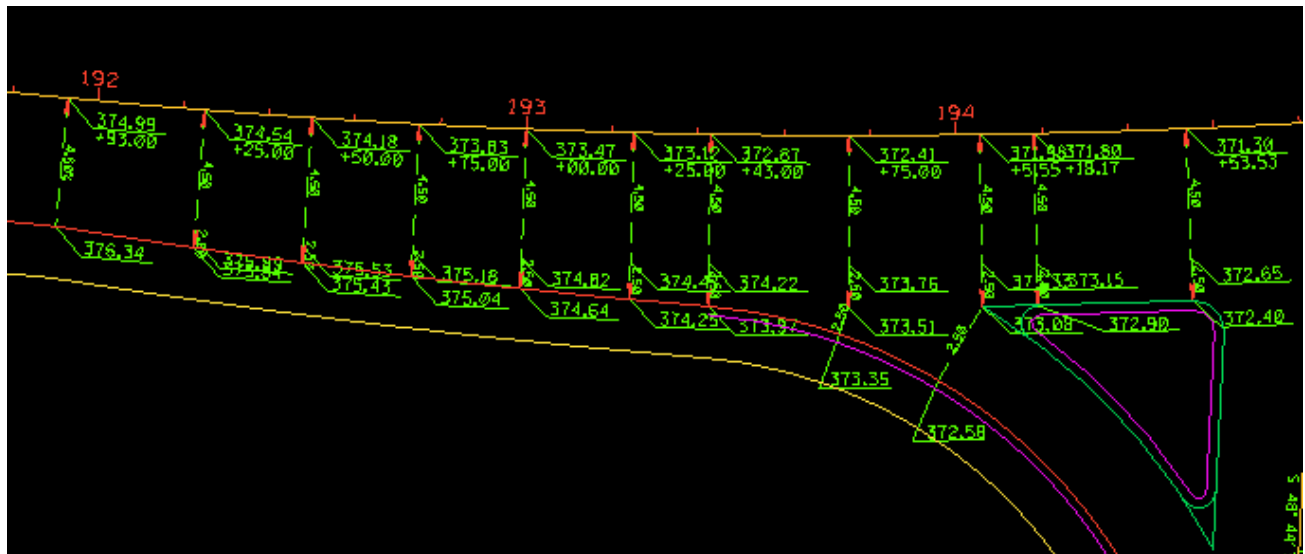
Placing Form Grades by Projecting Pavement Slopes To “Proposed EP in DGN”

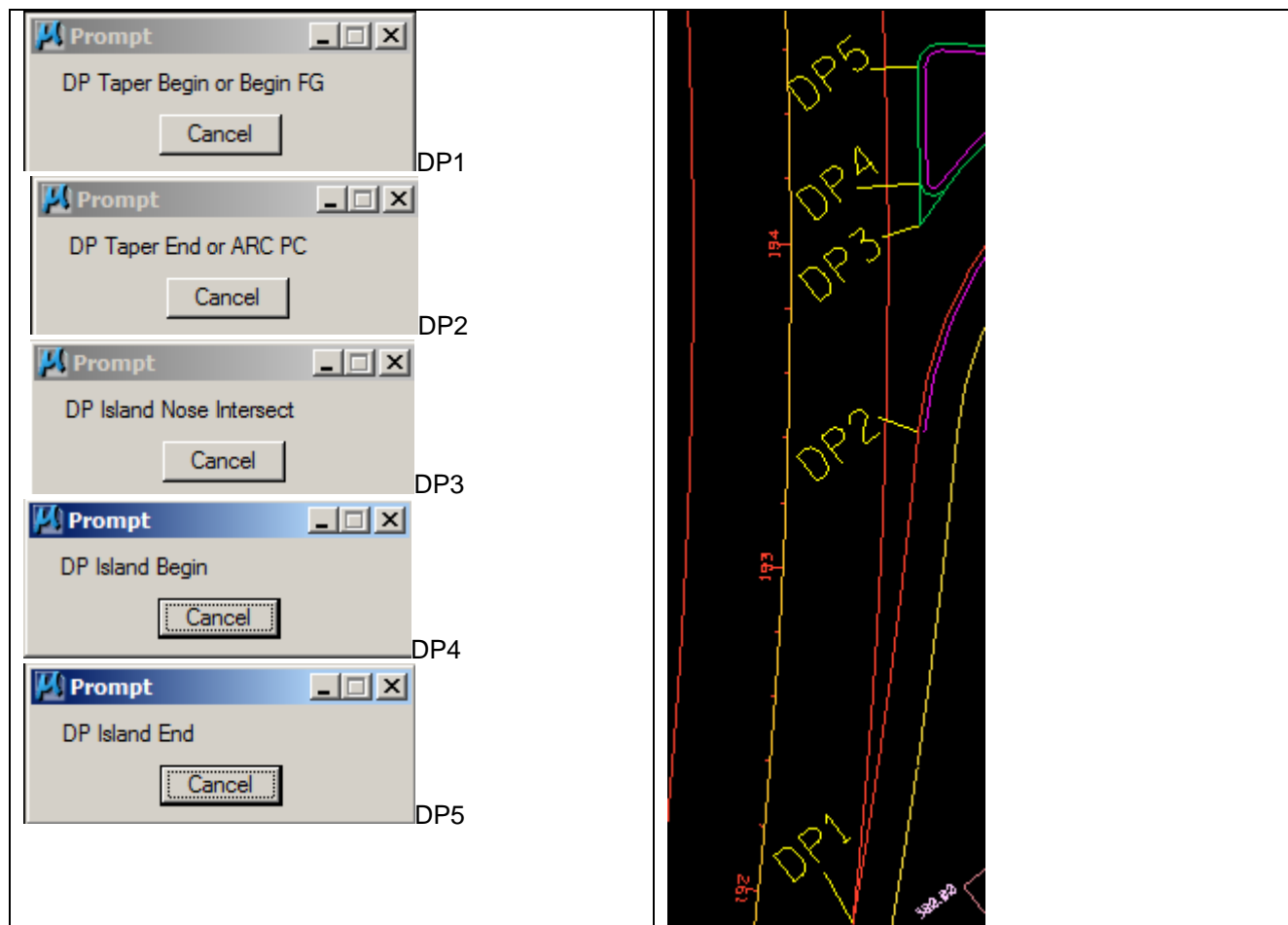


3PC –EP & Critical Pnts (Step 1)

3PC – EP & Critical Pnts (Step 2)

Projects superelevation slopes to EP except in entrance/exit ramp area where shoulder slope is placed to widened EP. Places Form Grade Labels at an even interval as specified by the user and at critical points such as taper begin/end, island intersect point, and island radius points. Also places Slope Lines. This is a 2 step process. Step 1 3PC just defines your EP DGN file and only has to be run once for a project. Step 2 actually places the labels.





Creating a Profile to Smooth Grades

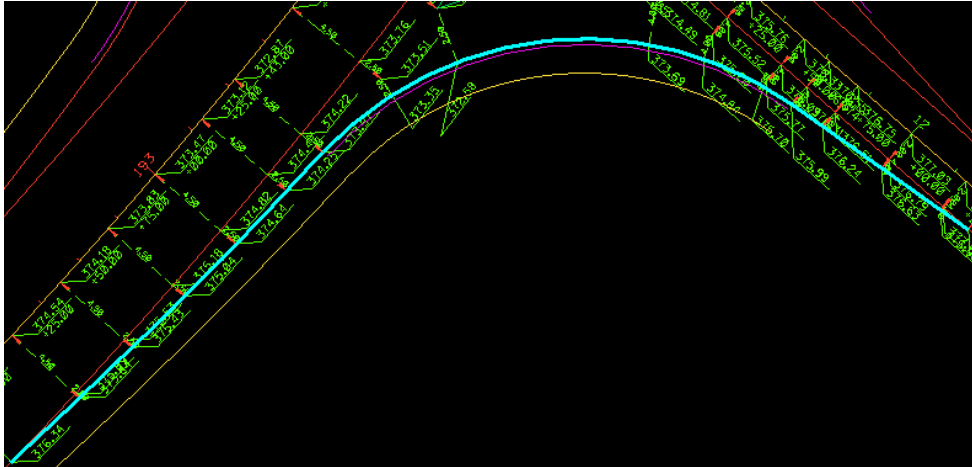
3PC – Create Profile from FG

This 3PC places draws a profile of selected Form Grade Elevation Labels. You will then set a grade to smooth out the form grades and fill in any gap areas. Then you will use the 3PC described below to place new form grades based on the profile.

STEP 1 – Store a chain along the EP. (See selected elements below.)

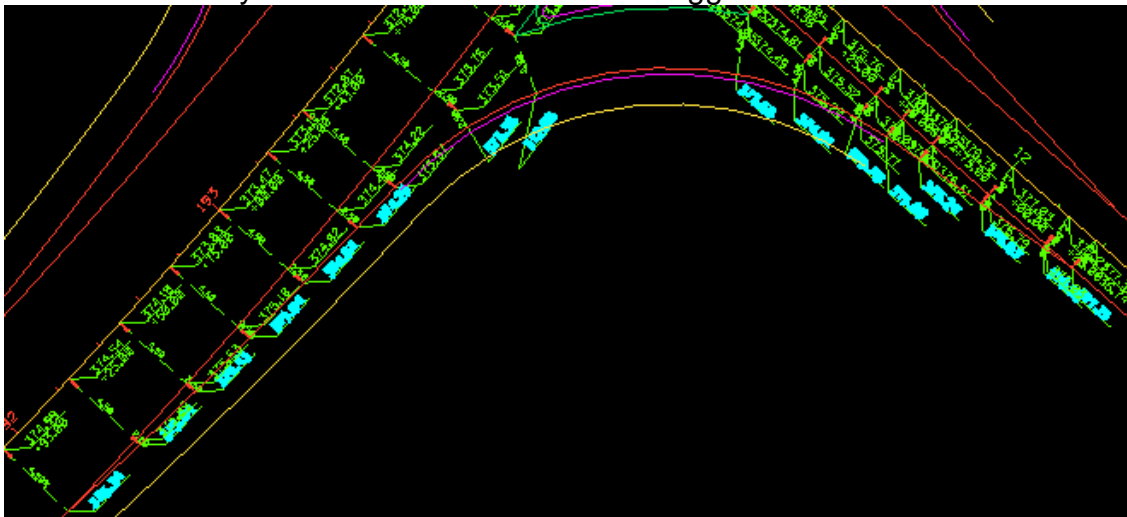
Notes:

- a) Drop the Line_Strings that represent the tapers before Storing the chain graphically.
- b) **Begin the Stationing at 0+00 or an even station.**

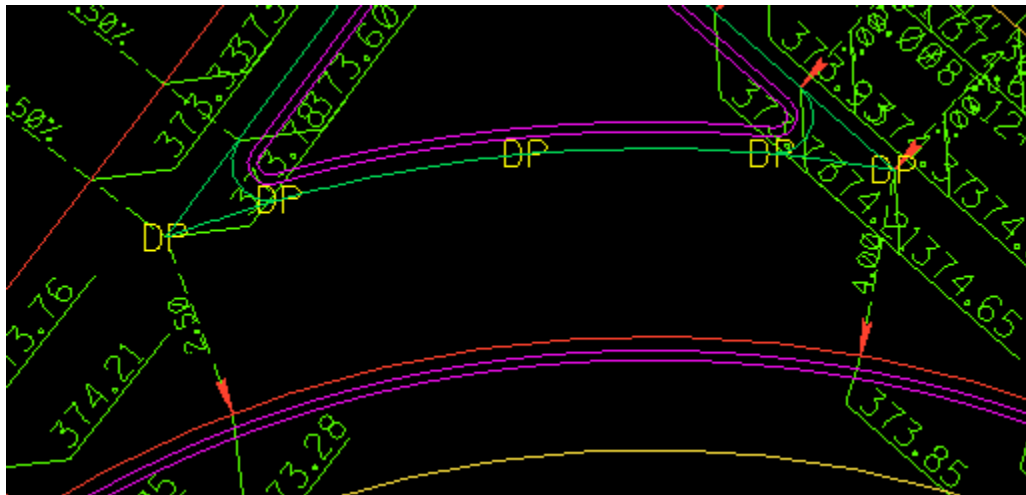
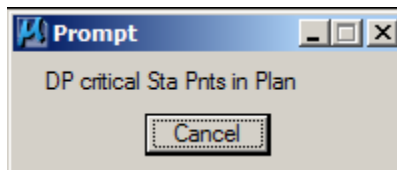


STEP 2 – Select the Elevation Text Labels.

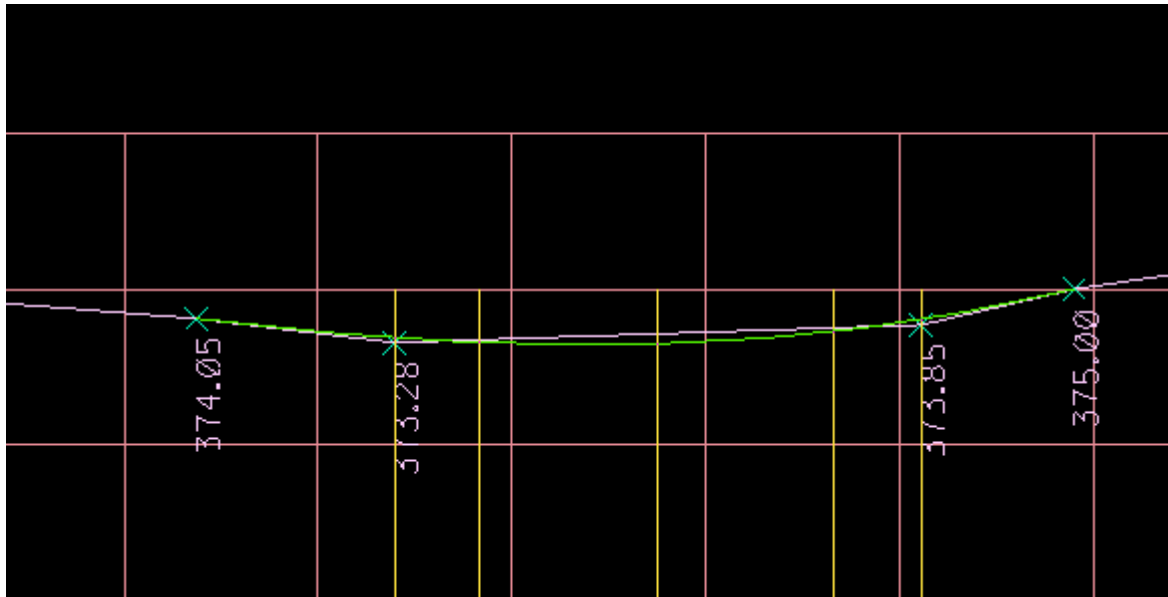
Note: These labels should have been placed with one of the 3PC's listed above. They have the X & Y coordinates tagged onto them.



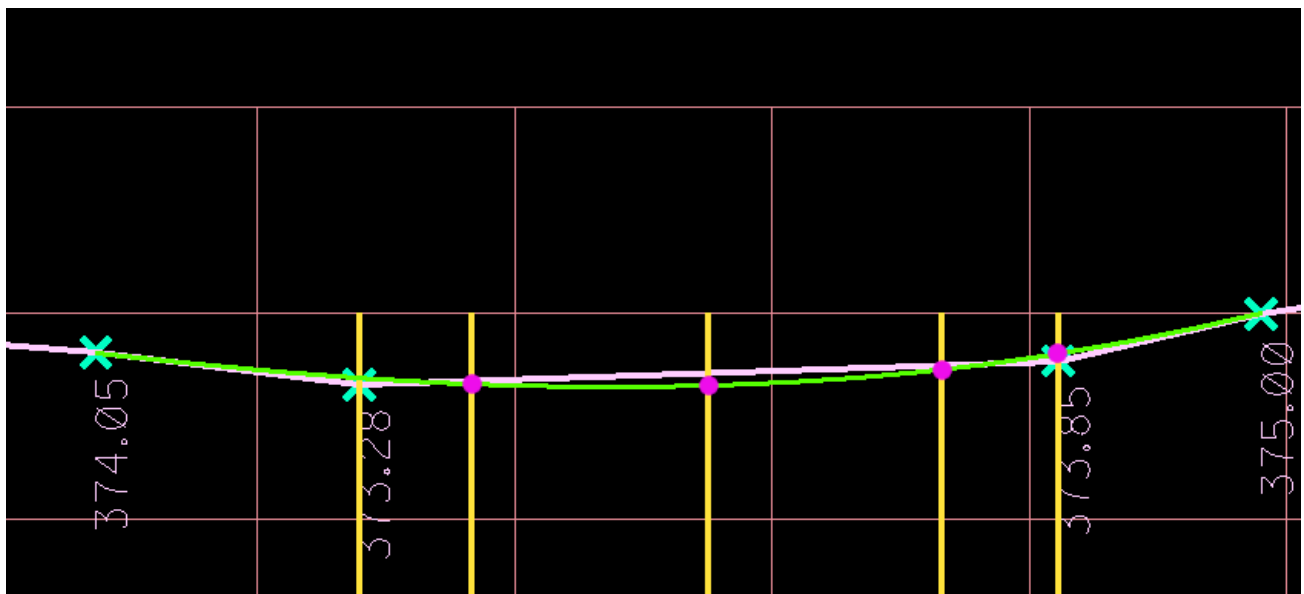
STEP 3 – Run the 3PC Create Profile from Form Grades to create the profile (See Below). User is prompted to DP any critical locations such as gore points, radius points, etc. The yellow lines shown below represent the Stations of these critical Plan View locations and the next figure represents where these critical DP's were issued.



STEP 4 – Use a Bspline Curve to smooth out the profile in any areas needed. (See Green Element below.)



STEP 5 – Use Place Point to place points along your smoothed out profile (Bspline) and at stations where you want new form grade labels (See white & yellow points below). This should be at the same Station of Form Grades previously placed (See Yellow points below) or in areas where you need to add supplemental form grade labels (See White points below.) Notice points were placed at the critical points also.

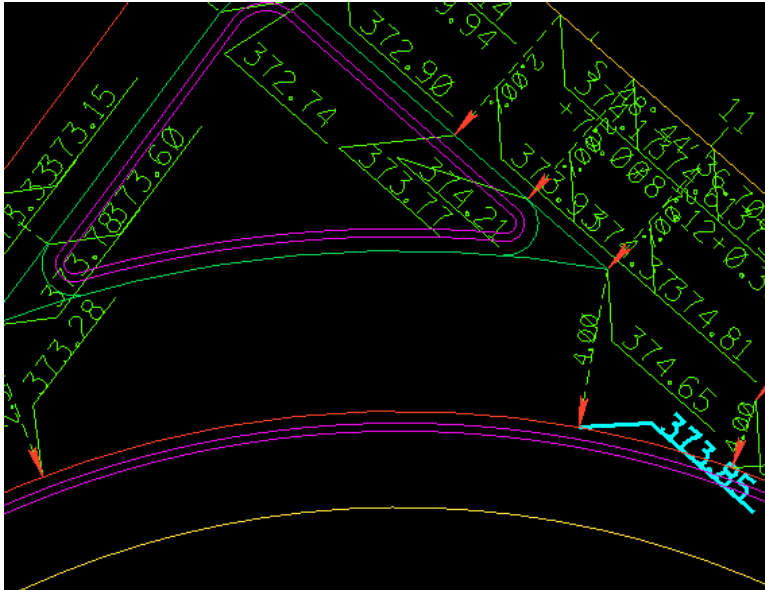


Go to the next section to see steps how to automatically take these points and convert to plan view Form Grade Labels.

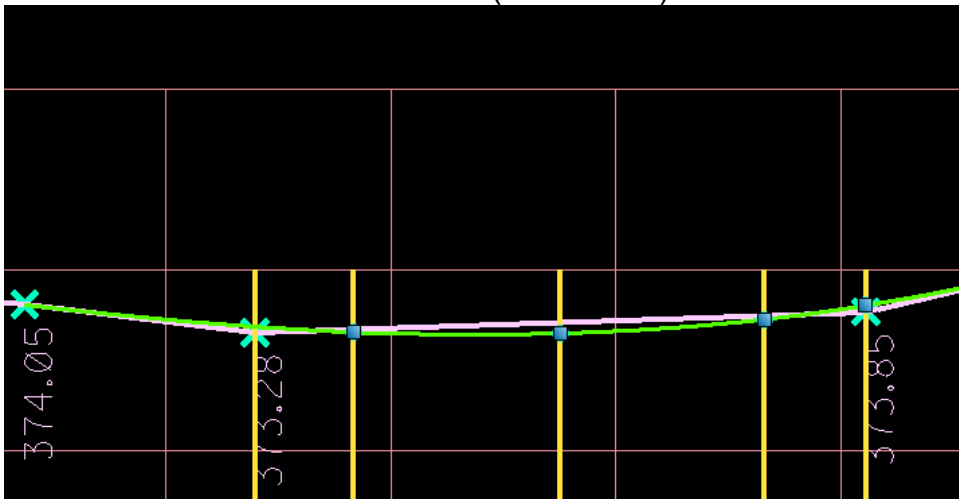
Placing Form Grades from Selected Profile Points

3PC – Labels from Profile

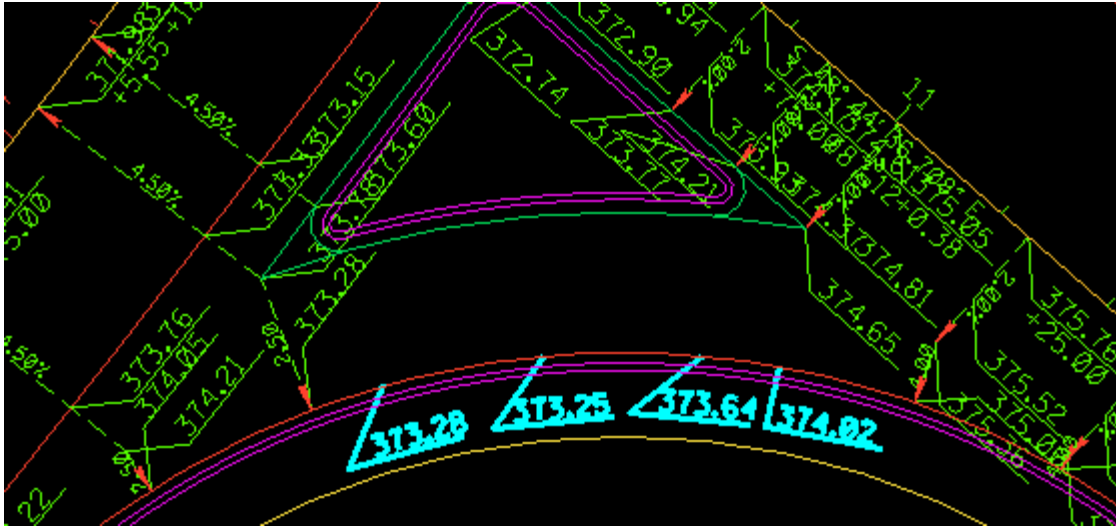
STEP 1 – In the Plan View, Delete any Form Grade Labels (and slopes leading to these labels) that are at the same station as the profile points you placed in Step 5 of the previous section. (See selected elements below.)



STEP 2 - Select the Profile Points (Not the X's).



STEP 3 - Run the 3PC Place Form Grades from Profile. See the highlighted labels below to see the labels placed in this example.



Placing Slopes between Points

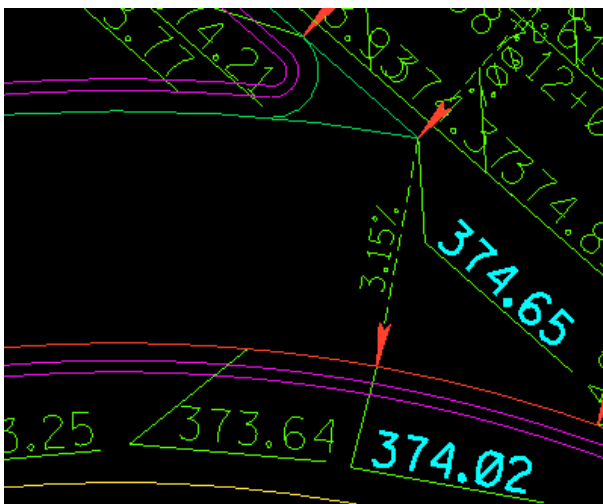
3PC – Slopes 2 points

This 3PC will place the slope between two Form Grade Label Points. Select the Elevation Text of 2 points and run the 3PC.

NOTE:

The Elevation Text Selected must have been placed with a 3PC. X&Y Coordinate values of the point in the form of Adhoc Attributes was added to this text when the label was placed.

In the example below, the blue elevation text was chosen and then the green slope, slope line, and arrow were placed.

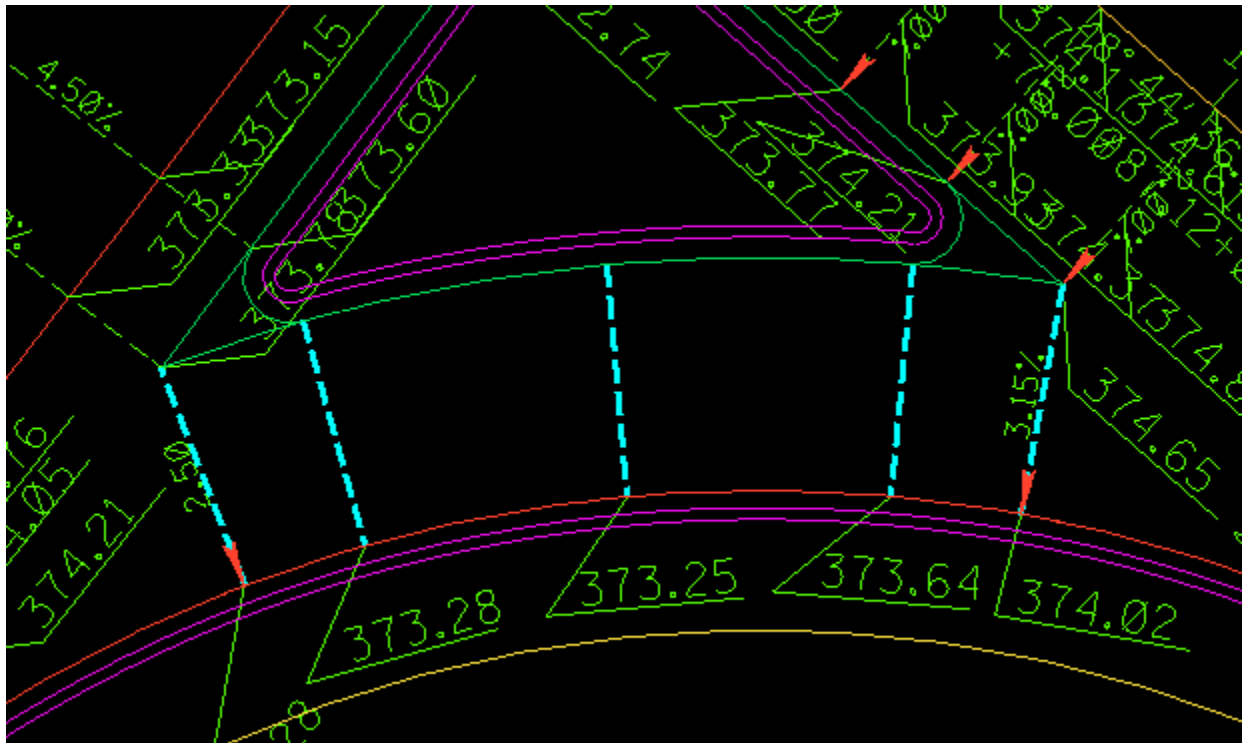


Interpolate Form Grade Slopes

3PC – Form Grade Slopes

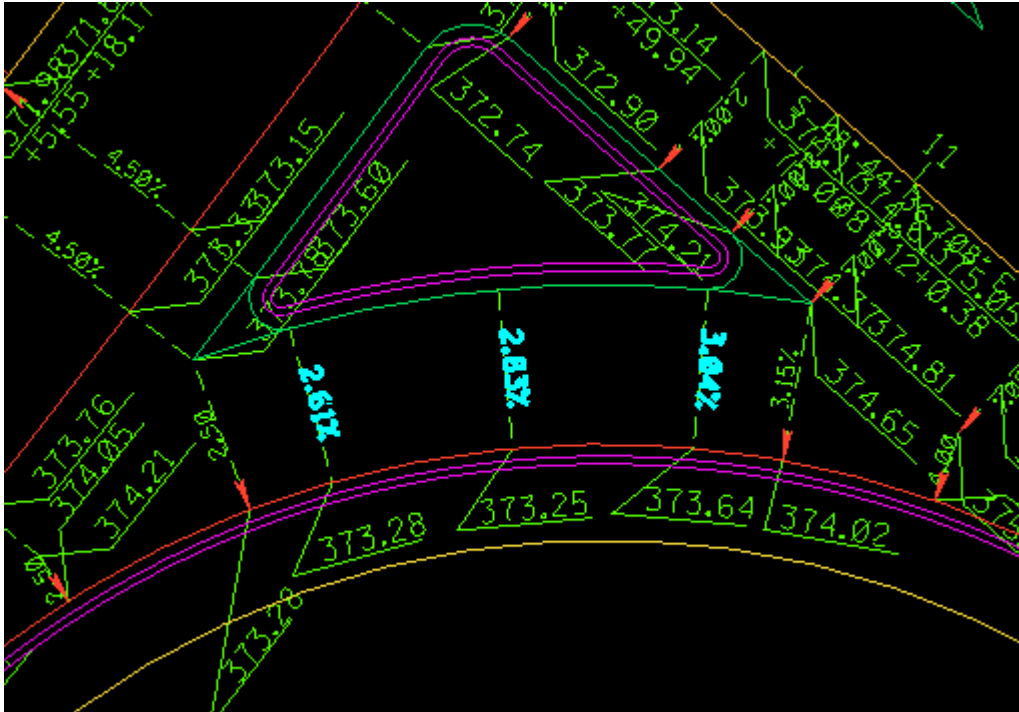
This 3PC interpolates and places Form Grade Slopes along selected lines.

STEP 1 - Place Lines perpendicular & then choose the lines.



STEP 2 – Run the 3PC Form Grade Slopes. You are prompted to DP the location and slope of the beginning and ending lines. In this example, this is +2.50 & +3.15

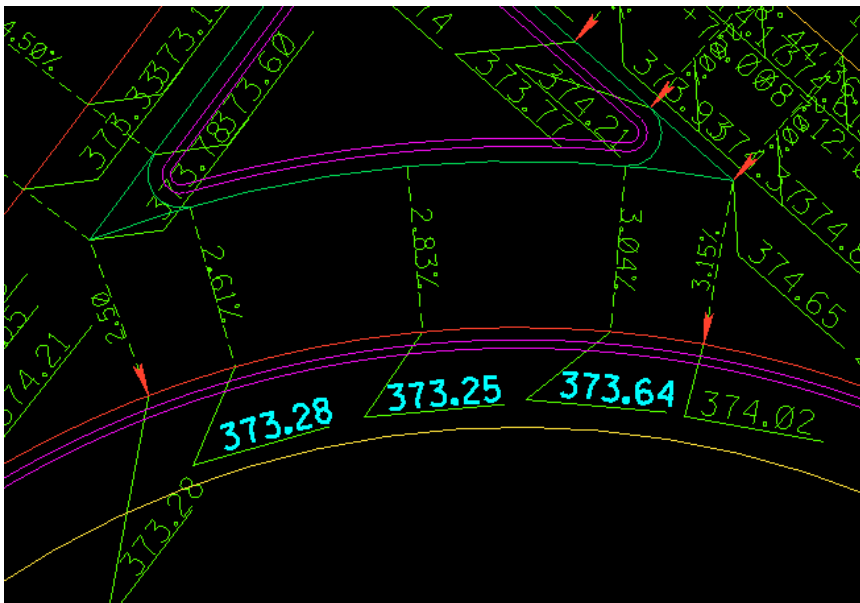
Slopes are calculated and placed along the lines. See highlighted elements below for what was placed.

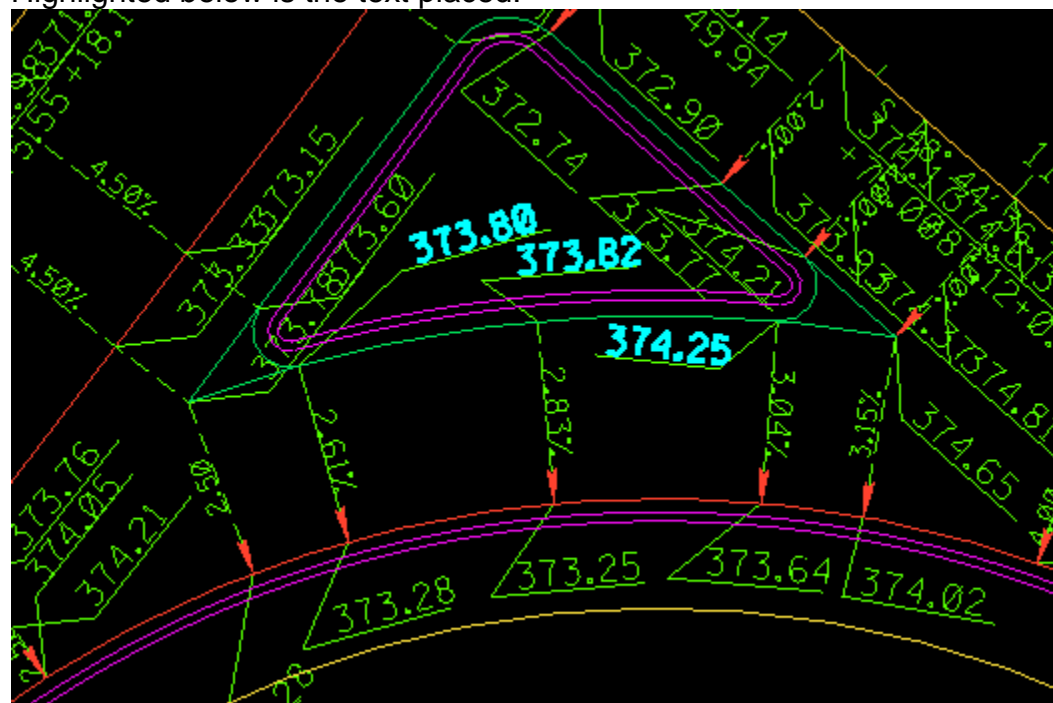
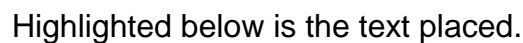
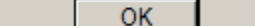


Place Form Grade Labels at Offset

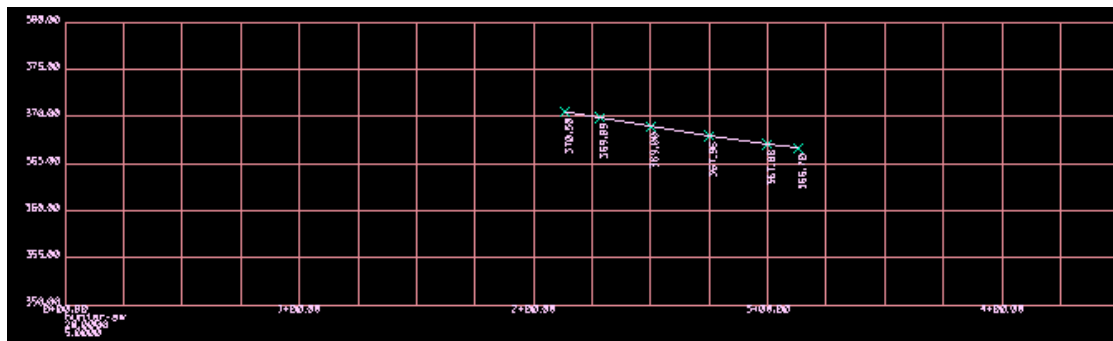
3PC – Labels Project Elev

This 3PC places the FG Label and Slope by projecting user specified slope from Selected Elevation Text to a user specified offset from a chain.





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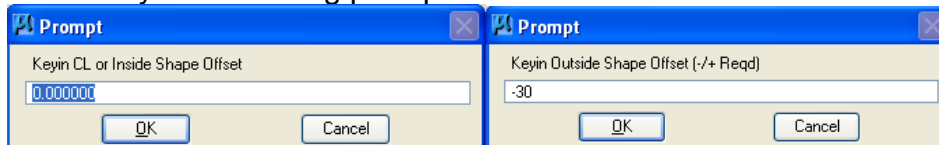
Other Tools

Placing Form Grades at Specific DP

3PC – Labels at DP

This 3PC places Form Grade Labels and slopes either Inside the Superelevation Shape area or at the projected pavement slope to a DP outside the Superelevation Shape area. This is generally used at critical locations not at even 25' increments such as the beginning/end of a taper, island PC/PT, etc.

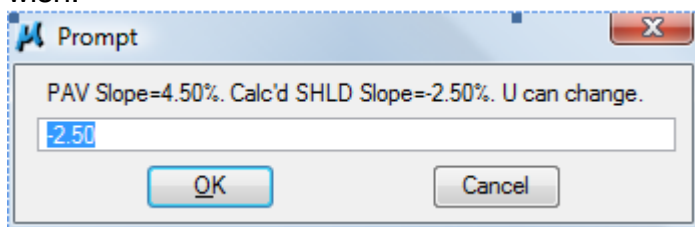
You send as many DP's as you want to either the left side or right side of your shapes as defined by the following prompts.



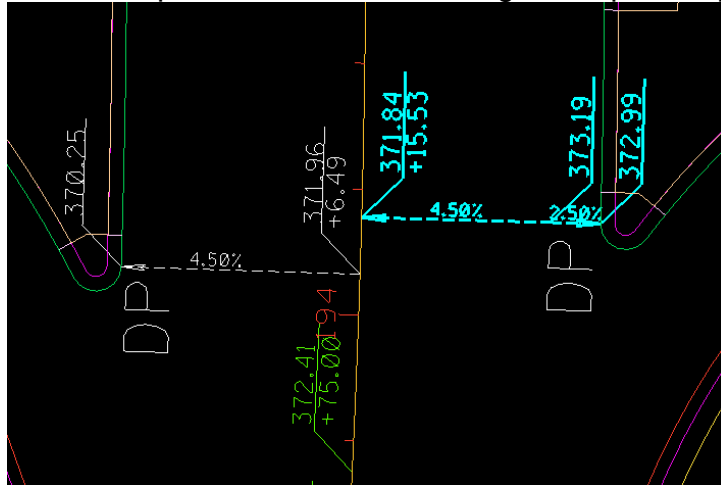
If you entered 0 for Inside & -30 for the Outside, all the DP's you send need to be left or along the 0 offset.

If you entered 0 for Inside & 30 for the Outside, all the DP's you send need to be right or along the 0 offset.

Once you send a DP outside your Superelevation Shaped area, you are shown the Pavement Slope & projected slope "Shoulder Slope" and can change projected slope if you wish.



For DP's outside the Shapes, in addition to a label being placed at the DP, Form Grade Labels are placed at the CL and edge of super shapes.

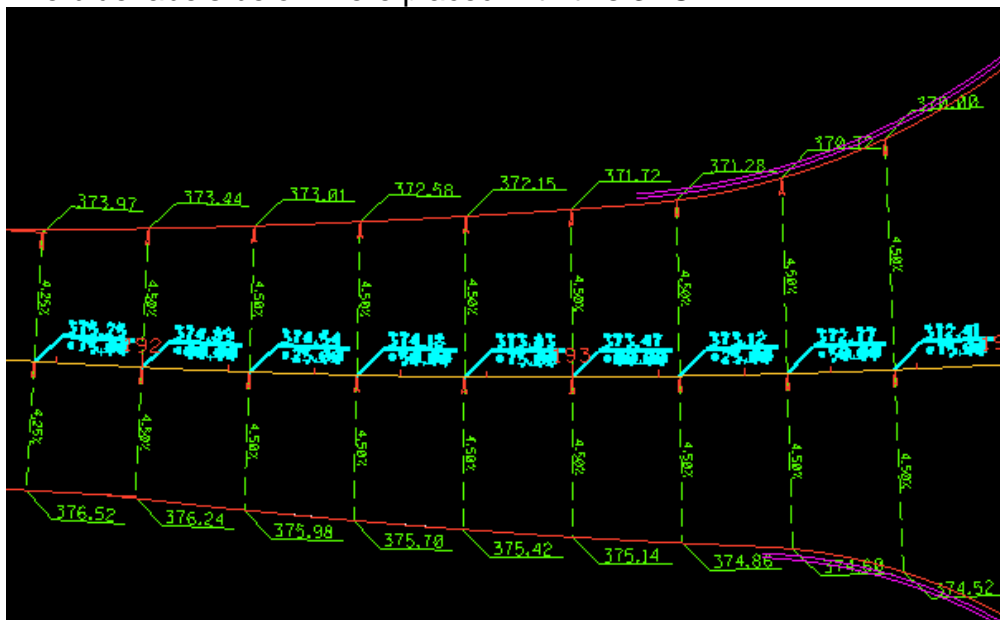


Placing Form Grades at Offset/Interval

3PC – Labels Interval

This 3PC places Form Grades at even intervals and at an offset within your Pavement (Superelevation Shape) area. Steps are shown below with an example graphics following that.

The blue labels below were placed with this 3PC.



Glossary of Terms

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